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- Albrecht, P.*—Sur les spondylocentres épipituitaires du crane, la non-existence de la poche de Rathke, et la presence de la chorde dorsale et de spondylocentres dans la cartilage de la cloison du nez de vertebres. Bruxelles, 1884.
- Sur le valeur morphologique de la trompe d'Eustache et les derives de l'arc mandibulaire et de l'arc hyoidien. Both from the author.
- Jordan, D. S., and Swan, J.*—Descriptions of Scaroid fishes from Havana and Key West, including five new species. Ext. Proc. U. S. Nat. Mus. From the authors.
- Putnam, F. W.*—Remarks on the antiquity of Man in America. Rep. Proc. Amer. Ant. Soc., April 30, 1884. From the author.
- Lawrence, G. N.*—Characters of a new species of Pigeon of the genus *Engyptila* from the Island of Grenada, W. I. From the Auk, Vol. 1, No. 2, April, 1884.
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- Ryder, J. A.*—On the preservation of embryonic materials and small organisms, with hints on mounting and imbedding sections. 1884. From the author.
- Allen, H.*—Allen's Human Anatomy. Section VI. Organs of sense, organs of digestion and genito urinary organs. Phila., 1884. From the author.

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GENERAL NOTES.

GEOGRAPHY AND TRAVELS.¹

ASIA.—*Recent Travels in Arabia.*—No more adventurous journey has been undertaken for many years than that of Mr. C. M. Doughty through the heart of Arabia, among wild Bedouins who had never previously been visited by an *Engleysy* and *Nasarang* an Englishman and a Christian, as our traveler freely avowed himself to be. Although this honest avowal caused Mr. Doughty to be in peril of his life on more than one occasion, yet he made friends among the nomads, and claims that his bold course has been the means of making the name of Christian respectable, instead of abhorred, in the vast stretch of country traversed by him.

In the early part of 1875 Mr. Doughty was at Petra, the remains of which he believes to be those of a few public halls or temples, and of sepulchres, while the city itself, probably built of clay, has disappeared. He was asked by the villagers whether he had seen the similar remains at Medyin Salih, ten journeys distant by the Haj or pilgrimage road from Maan, a station near Petra. He at once formed the resolution to visit these ruins, and in the autumn of 1876 accompanied the Haj to the spot. Medyin Salih is a level plain, sixteen miles long and as many broad, surrounded by sandstone precipices, and the ruins lie about a mile from the garrisoned station. The name signifies cities of Salih, who, according to Arab tradition, was a prophet who preached to the unbelieving people of Hel-Hejr until a judgment fell on them.

¹ This department is edited by W. N. LOCKINGTON, Philadelphia.

Hejr, or Hejra, was an emporium on the old gold and frankincense road of the Sabaeans. The houses, probably of clay, have vanished, and their site is marked only by bits of broken glass and pottery; but the sepulchral chambers, hewn out in the soft sandstone cliffs, still remain. The façades, full of cornices and pilasters, show a strange mingling of Egyptian and Greek. On the top of each is the stepped ornament so common at Petra. The pediments usually have at their sides urn-like ornaments, others have griffin-like figures. In some cases the tympanum has a man's head with the braided side-locks now called "horns" by the Arabians. In a gorge near by is a hall (the only excavated chamber not a sepulchre) with a number of engraved tablets. The inscriptions are in a Nabathean-like character.

Eleven miles further south, near the village of el-Ally, was the site of another old town. Here were a number of other inscriptions, not Nabathean but Himyaric in character. Baith Naam is the name handed down by tradition, and Mr. Doughty suggests that it may be the Badanatha of Pliny.

The "Harra" of Arabia is the "butte" of our own arid regions, a platform of sandstone preserved from erosion by a capping of basaltic lava. In one of these to the north of Medyin Salih the lava attains a depth of more than a hundred fathoms. The platform is studded with craters at the summits of cones rising from 200 to 600 or 700 feet. The highest, Jebel Anaz, rises 1000 feet or more.

Teyma is a village on the site of an ancient city of the same name. The houses are gone, but the old city wall, three miles around, still stands, together with the remains of some columns. Inscriptions were found here in a character which Sir H. Rawlinson thought to be allied to the Phœnician. The next spot examined after a visit to Hayil was Khaybar, which was reached by traversing another Harra known as the Harrat Khaybar. Near the middle of this region the altitude is nearly 6000 feet, and this Harra is the water-parting between east and west in Northern Arabia, the waters running eastwards in the great trough known as Wady-e'-Rumma, and westwards into the Wady-el-Humth. The former has long been known, but Mr. Doughty found its head near the villages of Hayat and Howeyat, while its mouth is at Sheyor, near Bosra, so that if it were a stream instead of a dry trough, it would be an affluent of the Euphrates. The Wady-el-Humth was previously unknown to geographers. Its head is in the steppes beside Tayif, and its mouth on the Red sea, between el-Wejh and el-Haura. Boreyda and Aneysa, the two largest towns in Nejd, have a population respectively of 5000 and 7000.

On his way from Aneysa to Jidda, in company with a caravan laden with *samma* or clarified butter, Mr. Doughty saw, on an elevated steppe on a basis of granite, the best natural pasture he

had seen in Arabia. The presence of the pastures is due to annual tropical rains, which fall for five or six weeks together, commencing at the end of August or the beginning of September. This region is occupied by the great Bedouin nation, Ateyba. In the last days of the journey the caravan passed alongside of the great southern Harras, where the lava had been poured out upon granite.

Arabia is a land of sepulchres and ruins. The modern Arab neither bores deep wells and builds stone houses, as did the ancient Arabians, nor even builds of clay and constructs dams, as in a more recent age. Among the most ancient remains are huge erect stones such as in England would be called Druidical, and buildings of huge Cyclopean blocks. The façades at el-Hejr are thought by Mr. Doughty to date from the earlier centuries of the Christian era. Barrows of prehistoric or uncertain age are numerous. Mr. Doughty has made drawings of three renowned idol-stones of the ancient Arabians. He also discovered an antelope which is new to science, and lives in the sandy deserts of Sherrarat, Kahtan and Muna.

The geology of Arabia is simple. A central cone of Plutonic rocks is overlaid by sandstones, and these again by limestones, sometimes with flints. The latter rocks, which appear again between the Dead sea and Jerusalem, are, Mr. Doughty believes, of nearly the same age as the chalk, while the underlying sandstones represent the greensand.

Mr. Doughty's journey was concluded in the autumn of 1878, although his account of his adventures is comparatively recent. A year ago the celebrated orientalist, Professor Julius Euting, traversed much of the same ground, discovered a large Aramaic column at Teyma, and obtained numerous inscriptions at Medyin Salih and El Ally; but a report spread among the Bedouins that his box of copies of inscriptions contained pure gold, and he with difficulty saved his life. He previously discovered a hitherto unknown Jewish temple at Palmyra.

Sir Charles W. Wilson's Notes in Anatolia.—Anatolia, or Central Asia Minor, is a plateau which rises gradually from 2500 feet in the west to some 4500 in the east, near the foot of the Anti-Taurus. The Taurus range, which in some places rises little higher than the plateau, but in others, as in the mountains of Lycia and the Bülggar Dag, attains 7000 to 8000 feet, buttresses the table-land on the south; on the west the edge of the plateau is broken by numerous broad valleys, without any very great elevation; on the north-west rises the high range of the Mysian Olympus; on the north stretches a range of varying altitude without a distinctive name; and on the east the Anti-Taurus supports a higher plateau that extends eastward to Erzerüm. Here and there minor ranges, as the Phrygian mountains and the Sultan

Dagh, rise above the general level, and there are some remarkable mountains of volcanic origin, among which Mount Argæus, near Kaiserieh, is the loftiest and best known (13,000 feet).

The streams of the central and southern part of the plateau are lost in salt lakes, or supply fresh-water lakes, the waters of which find their way beneath the Taurus and reappear as noble streams running to the south coast. Thus the waters of Eregli lake reappear as the sources of the Cydnus, whilst those of the large lakes, Beyshehr and Egirdir, swell the volume of the Melas and the Eurymedon. Many hot springs occur, marked often by the ruins of Roman baths, and still used by the Anatolians.

The climate is much like that of New England, cold in winter, hot in summer. On the south coast the winter is delightful. As three sides of the country are surrounded by water, there are three summer sea-breezes, from the north, west and south. These opposing breezes produce a calm belt of intense heat in the center. In winter intensely cold northern winds with torrents of rain and heavy falls of snow prevail. At the break-up of the winter a dry south wind rapidly thaws the snow, and by the evaporation produces a feeling of intense cold. Forests flourish most in the north, but the entire country has tracts which are nowhere surpassed for agricultural and fruit-growing purposes. The enormous mineral wealth of the country, gold, silver, lead, iron, chrome, rock-salt, kaolin, etc., is as yet undeveloped.

It is usually supposed that Anatolia is the home of the Turks, but it seems as though whenever the modern so-called Turk is examined, he is found to be the descendant of the native races of the country, and to differ from the Christians of the region only in religion. In Anatolia the Galatian and Cappaduan are still well-marked. Since the Greek war of independence there has been a great movement of Greeks to the western sea coast, resulting in the almost entire displacement of the Moslem population. The so-called Greeks of the interior are, however, of Pontic or Cappadocian origin. There are a few villages of true Turks in the Angora and Brusa districts; they occur also in the towns, and form most of the official class. Around the head of the Gulf of Scanderûn is a knot of mountains in the valleys between which flow the Cydnus (Teraus Chai), Sarus (Sihûn) and Pyramus (Jihûn). The Cydnus is formed by the junction of three streams which rise in deep gorges at the foot of the Taurus, here called the Bûlghar Dagħ. The Sihûn is formed by the junction of the Samanti and Saris, the former of which runs to the west of the Anti-Taurus, while the latter pursues its course along the rich open valley which divides the twin ranges of the Anti-Taurus. The Jihûn, formed by the union of several streams, breaks through the Taurus by a deep gorge, and then, after traversing some open country, bends to the west, passes through a narrow defile between the Giaour Dagħ and the Taurus, and enters the

Cilician plain, where it is joined by several important tributaries. The Giaour Dagħ runs from the Taurus south-west to the Mediterranean south of the Gulf of Scanderûn. The great Cilician plains is thus enclosed by the Taurus and Giaour Dagħ. The plain of Issus is parted off from it to the east by the hills of Jebel Nur east of the lower course of the Jihûn. The Cilician plain consists of a rich stoneless loam brought down by the rivers, but the plain of Issus is stony and uncultivated. The Giaour Dagħ, the Ansariyeh mountains, Lebanon, and the hills of Western Palestine form one side of the great hollow in which lie the valleys of the Orontes, Leontes, and Jordan, with their continuations to the Red sea. The eastern wall of this depression is formed by the Kûrt-Dagħ and the Anti-Lebanon. When the accounts of the movements of Darius and Alexander are compared with the topography of the plain of Issus, accessible only by three "gates," and narrow at its southern portion, it is probable that the Pinarus (on which Darius' army was encamped) is the stream which enters the sea south of Piyus.

GEOGRAPHICAL NOTES.—M. Aumoitte gives, in *L'Exploration*, a record of his journey from Hanoi through Bac-Ninh to Lang-Son, on the Chinese frontier. At the meeting of the provinces of Bac-Ninh and Lang-Son the country becomes mountainous, the roads are bad and the brigands have almost depopulated the district.—The first mail of the season from Kadiak brings the news that the eruption on Augustine island, Cook's inlet, was much exaggerated. The island was not split in two, nor was a new island formed, but the west side of the summit has fallen in, forming a new crater, and the entire island has risen so much that the only bay or boat harbor is filled up. The winter was mild, the lowest temperature was 10 F., and wild flowers were in bloom at the end of April.—Mr. Jos. Thomson reports that the region traversed by him from Mombasa to the north of Victoria Nyanza is entirely volcanic. One volcano, west of Kilimanjaro, shows signs of activity. Mount Kenia, though covered with trees, stands in a desert. The customs, dwellings, religion and language of the Masai, as well as their features, differ markedly from those of other African peoples known to Mr. Thomson.—The *Bolletino* of the Italian Geographical Society gives the regulations and programme of the first Italian Geographical Congress, which meets at Turin from Aug. 15 to 19. Among the subjects for discussion are, "What ethnological conclusions are to be drawn from recent anthropological and philological data regarding the indigenous populations of East Africa?" "What are the best means of organizing an independent Italian Expedition to the Antarctic seas?" "On the need of preparatory schools for training travelers," and "On the importance of establishing commercial stations in the Barbary States as a means of gaining

access to the Sudan.”—Mr. Holt Hallett and his party have reached Bangkok after an arduous journey of five months from Montmein. The work done comprises the surveying of over 1500 miles, the determination of the position of the Shan mountain ranges and a large series of observations of the vocabularies of the aboriginal races and the histories of the several Shan States. The expedition was everywhere well received, and has collected much information upon the interior of Indo-China.—The river Chandless, a tributary of the Purus, named after Mr. Chandless, who ascended the Purus in 1864 to a distance of 1866 miles from its mouth, was ascended last year by the Brazilian steamer *Santurem*. It flows from or through a large lake.—Mr. H. O. Forbes is making arrangements to visit Southeastern New Guinea.—Further notes of the travels of M. Giraud states that Lake Bangweolo proved to be only an immense morass. The Luapula flows out of the south side of the lake, and describes a long curve to the south and west for 100 miles before taking its definite northerly course. At the bend he was stopped by a great cataract, named Mombuttuta, and by hostile natives who made his party prisoners and seized his boat. After two months he escaped and joined his caravan, which he had sent on to Cazembe, but here again he was plundered of his stores and most of his carbines. After narrowly escaping death by hunger, he reached the station of the London Missionary Society, at Lake Tanganyika, and was aided to cross to Karema. He describes Lake Maero as a large and beautiful lake, with high banks. He will resume his journey as soon as his stores are replenished.—After the departure of Lieut. Wissmann, the late Dr. Pogge returned to Tushilange Land, where he remained until November 9th, 1883, when, as no news reached him, and his means were nearly exhausted, he decided to return to the west coast. From a letter which he wrote at Malange, February 2d, 1884, it appears that before crossing the Kassai, he made a detour northward, and found that the Lulua joins that river five days march north of Mofuka. He then proceeded parallel to the Kassai as far as Kikassa, where he crossed the river, going south-westward across the Loange, Quilu, and Ohamba. He had scarcely reached St. Paul de Loanda when he was attacked by inflammation of the lungs, and died March, 10th, 1884.—The Danish government has sent Lieut. Jansen and Herr Lorenzen to explore the outskirting land of Greenland, between Holsteinburg and Sukkertoppen, a part as yet unvisited by Europeans. An expedition to the east coast of Greenland will be undertaken by Lieut. Holm.—The country of the Phou'ons, situated between Tongking and Laos, on the upper waters of the Song-Câ and Song-Pho, tributaries of the Gulf of Tonking, and on the upper parts of the Nam-Sam and Nam-Muon, affluents of the Mekong, has during the last ten years suffered much from the invasions of the Hôs or

Chinese, who are driven onwards by the misery and excess of population that exists in the southern provinces of China.—Sir Buonfanti, in his recent expedition across North Africa, was compelled to desist from his attempt to penetrate the unexplored region south of Adamawa, and finally, making his way to the Niger at Say, midway between Timbuktu and the Binue confluence, ascended the river to the former place. As this feat, before believed impossible, was performed in the dry season, the fact has considerable commercial importance. From Timbuktu the explorer passed through Massina and Bambarra to the almost unknown territory of Tombo, where the expedition was plundered and dispersed. After great sufferings, Sir Buonfanti reached a Catholic mission in the Bussanga country north of Dahomey.—In the western part of the Straits of Magellan glaciers exist on the slopes of a range of mountains the highest peaks of which are not above 4500 feet. The winds from the Pacific, eternally blowing from the west, and full of moisture, keep up a constant condensation, and the glaciers exist wherever the broken ground allows them a foot hold. The largest observed by Mr. W. J. L. Wharton was the Northbrook glacier, with an area of from fifty to seventy square miles.—The Russian government has under consideration a plan for an expedition to the North Pole. Depots will be established at the Jeannette, Bennett and Henriette islands. From these islands the journey will be continued to Franz-Josef Land by steamer, and thence on sledges and on foot.

GEOLOGY AND PALÆONTOLOGY.

BLANFORD ON HOMOTAXIS OF GEOLOGIC PERIODS.—In his address before the British Association for the Advancement of Science at Montreal, Mr. W. T. Blanford devoted considerable attention to some remarkable exceptions to the rule that similarity of faunas and floras in fossiliferous formations throughout the surface of the world implies identity of geological age.

Some interesting contributions have been made to this question by the geological survey of India, where Mr. Blanford's experience has been chiefly derived, and by the geologists of Australia and South Africa; and he first noticed a few typical instances, several of them Indian, in which the system of determining the age of various formations by the fauna or flora has led to contradictory results, and then showed where the source of error appears to lie. The famous Pikermi beds of Greece, a few miles east of Athens, contain a vertebrate fauna nearly always quoted as Miocene; but they overlies strata with well-proved Pliocene marine Mollusca. The Siwalik beds that flank the Himalaya north of Delhi are still classed as Miocene by most European writers, but are regarded as Pliocene by the Indian survey, on evidence found by tracing them west and south into Sind. The